

GPS transfer of calibration at NIM (1105-2020)

Summary

In July 2020, the National Institute of Metrology (China, UTC acronym NIM) conducted a transfer of calibration from its G1-calibrated GPS receivers IM06 to the receiver BJNM (IM05) which calibration was dubious.

The operations and report of measurements are described in the [report by NIM](#).

- **Final results for the calibrated systems**

The INTDLY values of the receivers given in Table 1 have been computed by NIM based on the results of the Group 1 trip [1001-2018](#) for IM06 (GPS) and should not be updated to reflect later changes in the conventional INTDLY values of the reference receiver.

For a P3/PPP UTC link A-B involving any Group 1 and any receiver in this trip, the uncertainty resulting from the calibration, $U_B(A-B)$, is computed as

$$U_B(A-B) = (U_{CAL0}^2 + \Delta U_{CAL}(A)^2 + \Delta U_{CAL}(B)^2)^{1/2} \quad (1)$$

where $U_{CAL0} = 1.7$ ns is composed of the conventional Group 1 value (1.5 ns) and the uncertainty of the transfer (0.8 ns), and where ΔU_{CAL} (generally zero) is specified for each system. For UTC use, the ageing uncertainty will be based on the date of original calibration of IM06 i.e. 2018/08/15.

For single frequency C1 links, U_{CAL0} is 1.7 ns but could be complemented by an additional component to represent systematic errors in the ionospheric model.

Changes in the set-up of the receivers after the calibration must be accounted for as described in section A.3.6 of the most recent Calibration guidelines in <ftp://ftp2.bipm.org/pub/tai/publication/gnss-calibration/guidelines/>.

Table 1. Final P1/P2/C1 INTDLY values from the 1105-2020 exercise. Values of REFDLY and CABDLY during the calibration are also indicated for reference. All values are in ns. “Meas. Date” refers to the first day of the differential calibration, to which the calibration results can be applied. “Impl. Date” is the MJD when the results should be implemented in the receiver.

System	BIPM	Meas. date	INTDLY P1	INTDLY P2	INTDLY C1	REFDLY	CABDLY	Note	ΔU_{CAL}	Impl. date
BJNM	IM05	2020/07/28	69.2	76.4	70.8	324.8	125.0		0.0	59092

Notes:

(1).

Version history

V1.0 2020/09/02: Publication of results from V3.0 of the NIM report on the transfer of calibration.